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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/565,380	01/23/2006	Genichiro Ota	L9289.06101	5562

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EXAMINER	
TIMORY, KABIR A	

ART UNIT	PAPER NUMBER
2611	

MAIL DATE	DELIVERY MODE
12/08/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/565,380	OTA ET AL.	
	Examiner	Art Unit	
	KABIR A. TIMORY	2611	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) *2-3, and 5* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,4 and 6-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

1. This office action is in response to the amendment filed on 08/28/2009. Claims 1, 4, and 6-8 are pending in this application and have been considered below. Claims 2-3 and 5 are withdrawn by the applicant.

2. The objection to the specification was not addressed by the amendment. Therefore, the objection is not withdrawn.

3. The objections to the claims are corrected by the amendment. Therefore, the objections are withdrawn.

4. Applicant arguments regarding the rejection under 35 U.S.C. 102(b) as being anticipated by Daoud et al. (US 4835791) have been fully considered but they are **not persuasive**. The examiner thoroughly reviewed Applicant's arguments but firmly believes that the cited reference reasonably and properly meets the claimed limitation as rejected.

Applicant's argument: "Claim 1 defines a modulation apparatus that performs single side band (SSB) modulation to obtain a lower side band (LSB) signal using a carrier frequency that is higher, by the fundamental frequency of an input symbol, than a carrier frequency that is used to obtain an upper side band (USB) signal. **The claimed**

subject matter provides an advantage of supporting the multiplexing of an LSB signal and a USB signal in a frequency band having a bandwidth equal to the bandwidth of either LSB and USB signal, so as to reduce the bandwidth required to communicate these signals and increase the communication spectral efficiency (see Figs. 4A-4D and the published specification at paragraph [01061, lines 1 8-19).

Daoud discloses nearly the opposite feature to the Applicants' claimed subject matter of obtaining a LSB signal using a carrier frequency that is higher, by the fundamental frequency of an input symbol, than a carrier frequency used to obtain a USB signal. Specifically, Daoud discloses obtaining a USB signal using a carrier frequency that is slightly higher (so as to reduce crosstalk) than a carrier frequency used to obtain an LSB signal. Thus, Daoud's modulator generates a combined modulated signal comprising the LSB and USB signals that requires slightly more than twice the bandwidth of each of the LSB and USB signals, whereas the LSB and USB signals produced by the claimed modulation apparatus are combined within the bandwidth of either LSB and USB signal….."

Examiner's response: In response to applicant's argument that the references fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., **The claimed subject matter provides an advantage of supporting the multiplexing of an LSB signal and a USB signal in a frequency band having a bandwidth equal to the bandwidth of either LSB and USB signal, so as to reduce the bandwidth required to communicate these signals and increase the communication spectral efficiency**) are not recited

in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns,* 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993).

5. New ground of rejection with respect to the new claims 6-8 has been provided.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1, 4, 6, and 8 are rejected under 35 U.S.C. 102(b) as being anticipated by Daoud et al. (US 4835791) (disclosed in the IDS filed on 01/23/2006).

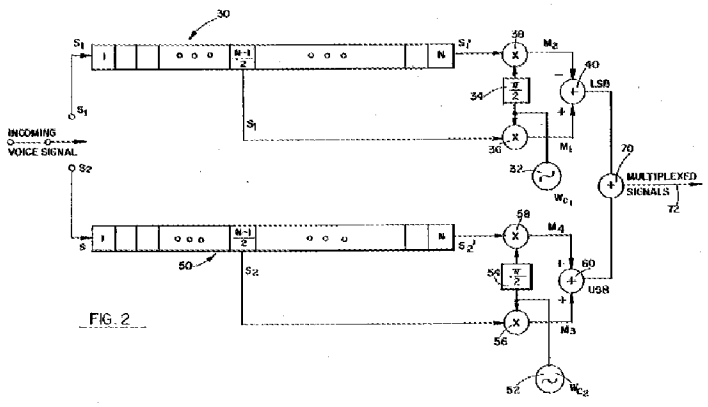

FIG. 2

Regarding claims 1 and 4:

As shown in figures 1-3, Daoud et al. disclose a modulation apparatus comprising:

- a first frequency-increasing single side band (SSB) modulator **(30 in figure 2)** that performs SSB modulation on a first input symbol **(S2 in figure 2)** to obtain an upper side band (USB) signal **(USB in figure 2) (col 2, lines 29-47)**;
- a second frequency-increasing SSB modulator **(50 in figure 2)** that performs SSB modulation on a second input symbol **(S1 in figure 2)** to obtain a lower side band (LSB) signal **(LSB in figure 2) (col 2, lines 29-47)**; and
- a combiner **(70 in figure 2)** that combines the USB **(USB in figure 2)** signal and the LSB signal **(LSB in figure 2) (col 2, lines 29-47)**,
- wherein the second frequency-increasing SSB modulator performs SSB modulation to obtain the LSB signal using a carrier frequency higher than a carrier frequency used in the first frequency-increasing SSB modulator by the fundamental frequency of the input symbol **(col 4, lines 38-49)**.

Regarding claims 6 and 8:

Daoud et al. further disclose demodulation apparatus **(see figure 3)** for demodulating a signal combined by the combiner **(70 figure 2)** in the modulation apparatus **(see figure 2)** according to claim 1, the demodulation apparatus comprising:

- a first frequency-decreasing demodulator **(82, 86, and 90 in figure 3)** that demodulates an input modulation signal by a cosine curve with a predetermined carrier frequency **(W_{c1} in figure 3)** to obtain a first demodulation signal **(see the first**

demodulation signal provided by first demodulator in figure 3) (col 4, lines 38-49, col 5, lines 43); and

- a second frequency-decreasing demodulator **(84, 88, and 92 in figure 3)** that demodulates an input modulation signal by a sine curve with a carrier frequency higher than the carrier frequency **(W_{c2} in figure 3)** used in the first frequency-decreasing demodulator by the fundamental frequency of a symbol **(see the second demodulation signal provided by second demodulator in figure 3) (col 4, lines 38-49, col 5, lines 43)**.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

9. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Daoud et al. in view of Belotserkovsky (US 6628735)

Regarding claim 7:

Daoud et al. further disclose a detector **(80 in figure 3)** that performs quadrature detection on an input modulation signal **(72 in figure 3)** by a predetermined carrier frequency to obtain a first detection signal and a second detection signal **(figure 3**

shows that CODEC 80 (detector) is producing first and second signals for demodulation).

Daoud et al. disclose all of the subject matter as described above except for specifically teaching an analog/digital converter that quantizes the first detection signal and the second detection signal with an over-sampling frequency four times or more of an entire bandwidth of the detection signal; a fast Fourier transform (FFT) circuit that performs Fourier transform on the first detection signal and the second detection signal quantized; and a signal detector that detects a signal before being modulated based on an output signal of the FFT circuit, using a signal in each carrier frequency and another signal in an adjacent frequency on a USB or an LSB side.

However, Belotserkovsky et al. in the same field of endeavor teach an analog/digital converter **(92 and 93 in figure 3)** that quantizes the first detection signal and the second detection signal with an over-sampling frequency four times or more of an entire bandwidth of the detection signal **(in col 7, lines 1-11, Belotserkovsky et al. discloses: "Referring now to FIG. 6, a sampling frequency correction network 120 is shown. It should be noted the network 120 may be embodied in software, hardware, or some combination thereof. Network 120 receives a sampled signal from a sampler 122 having analog to digital converters (e.g., ADCs 92 and 93 in FIG. 3) driven by a variable clock circuit (e.g., clock circuit 94 in FIG. 3). As discussed above, sampler 122 may be sampling the received signal at a frequency that is different than the sample rate of the transmitter. This difference in sample rate generates a sampling frequency offset that can be detrimental to the performance of the receiver". Therefore the examiner is interpreting that sampling the received signal at a frequency that is different than the sample rate of the transmitter to be "over-sampling frequency four times or more") (col 5, lines 24-31)**; a fast Fourier transform (FFT) circuit **(100 in figure 3)** that performs

Fourier transform on the first detection signal **(q1 in figure 3)** and the second detection signal **(p1 in figure 3)** quantized; and a signal detector **(102 in figure 3)** that detects a signal before being modulated based on an output signal of the FFT circuit **(100 in figure 3)**, using a signal in each carrier frequency and another signal in an adjacent frequency **(y_{-N} - y_N in figure 3)** on a USB or an LSB side **(col 5, lines 24-67, col 6, lines 1-8)**.

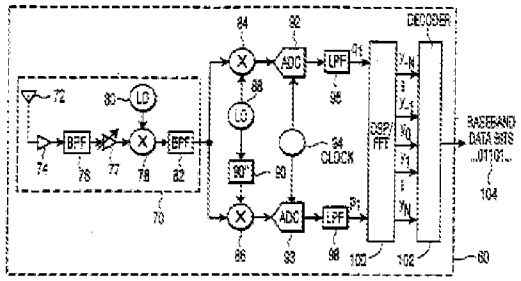

FIG. 3
(PRIOR ART)

Although Belotserkovsky disclose an OFDM modulation/demodulation, however, in column 4, lines 49-52, he discloses that other modulation techniques such as single-sideband SSB modulation can be used with his system. Therefore, it would have been obvious to one ordinary skill in the art at the time the invention was made to substitute the demodulator as taught by Belotserkovsky et al. with demodulator of Daoud et al. in order to yield predictable results **(KSR - simple substitution rationale)**.

Conclusion

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to KABIR A. TIMORY whose telephone number is (571)270-1674. The examiner can normally be reached on 6:30 AM - 3:00 PM Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Shuwang Liu can be reached on 571-272-3036. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Kabir A Timory/
Examiner, Art Unit 2611
/Shuwang Liu/
Supervisory Patent Examiner, Art Unit 2611